

Bio Fuel's Effect on Production Costs

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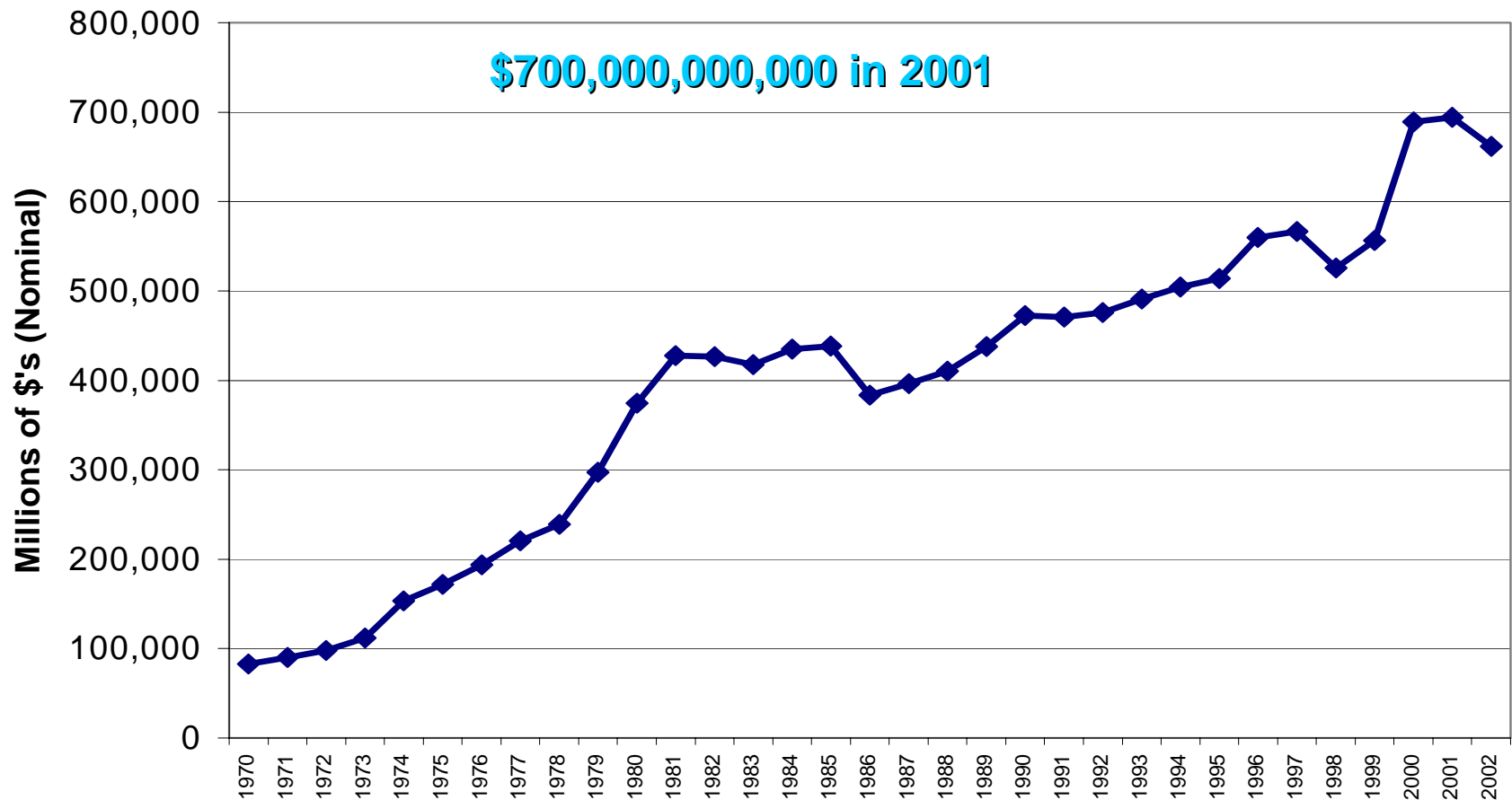
Why the Interest in Bio-Energy

- + Rising energy prices
 - + Increasing concern over the environment
 - + Development of government incentives to start the industry
-

= Economic Opportunity

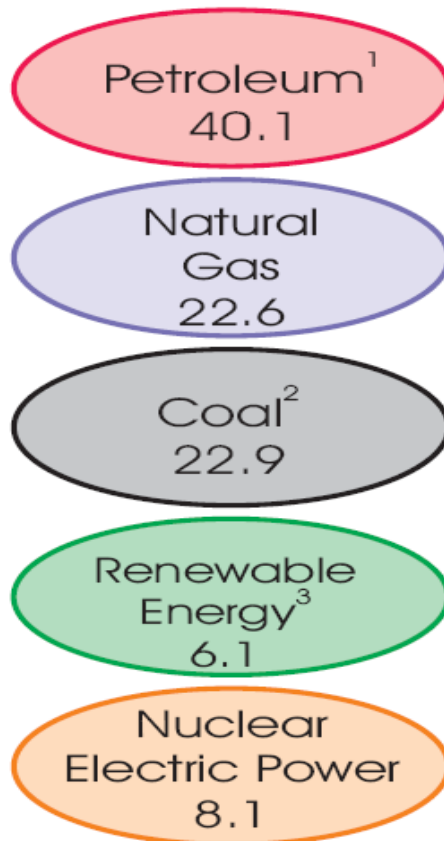
Energy Markets are Very Large!

Expenditures on Energy, 1970-2002



Where does the energy go?

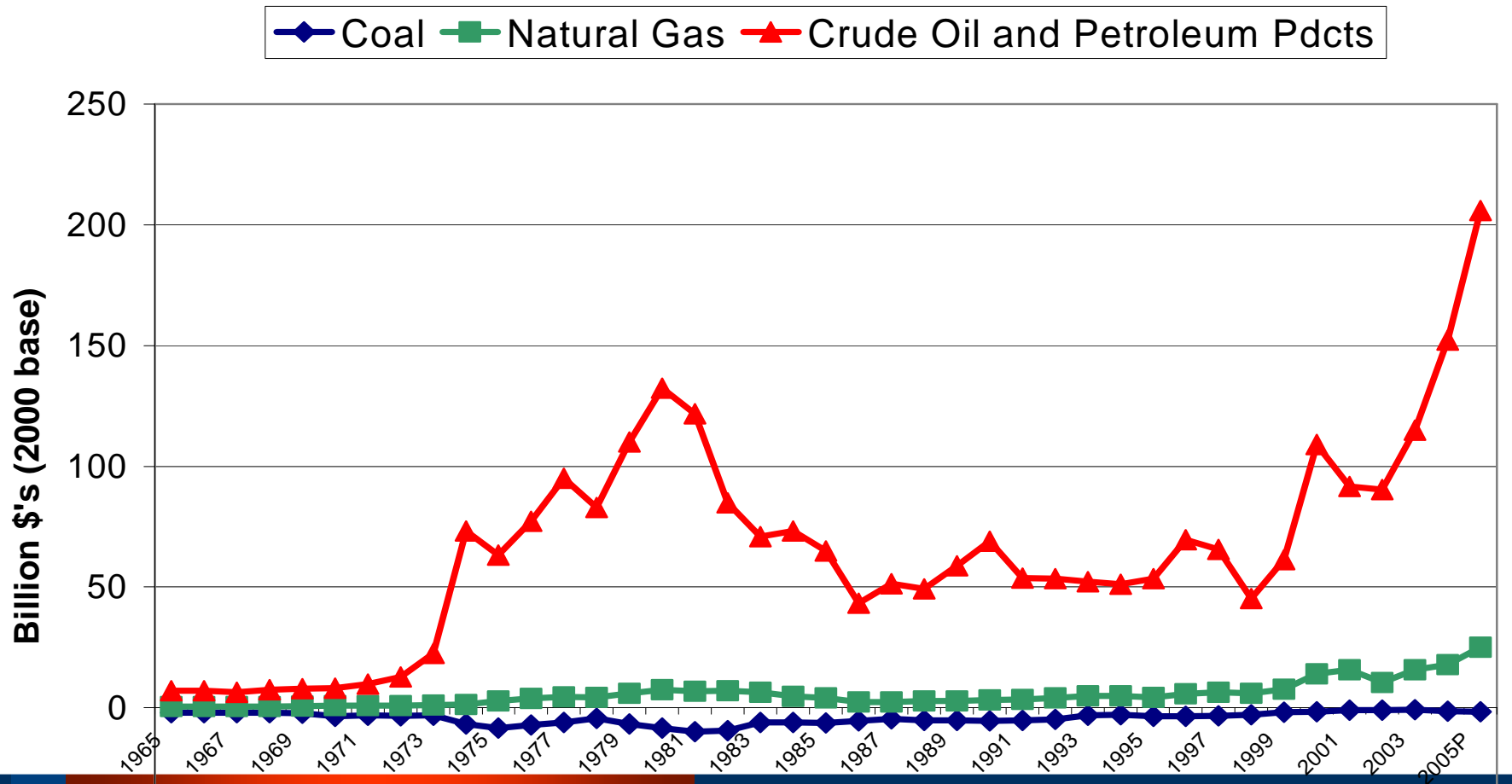
U.S. Primary Energy Consumption by Source and Sector, 2005
(Quadrillion Btu)



Source: Energy Information
Administration, U.S. Dept. of Energy

Spending on Imports has Increased

Net Fossil Fuel Imports by Type, 1965-2005



A Quick Oil Quiz

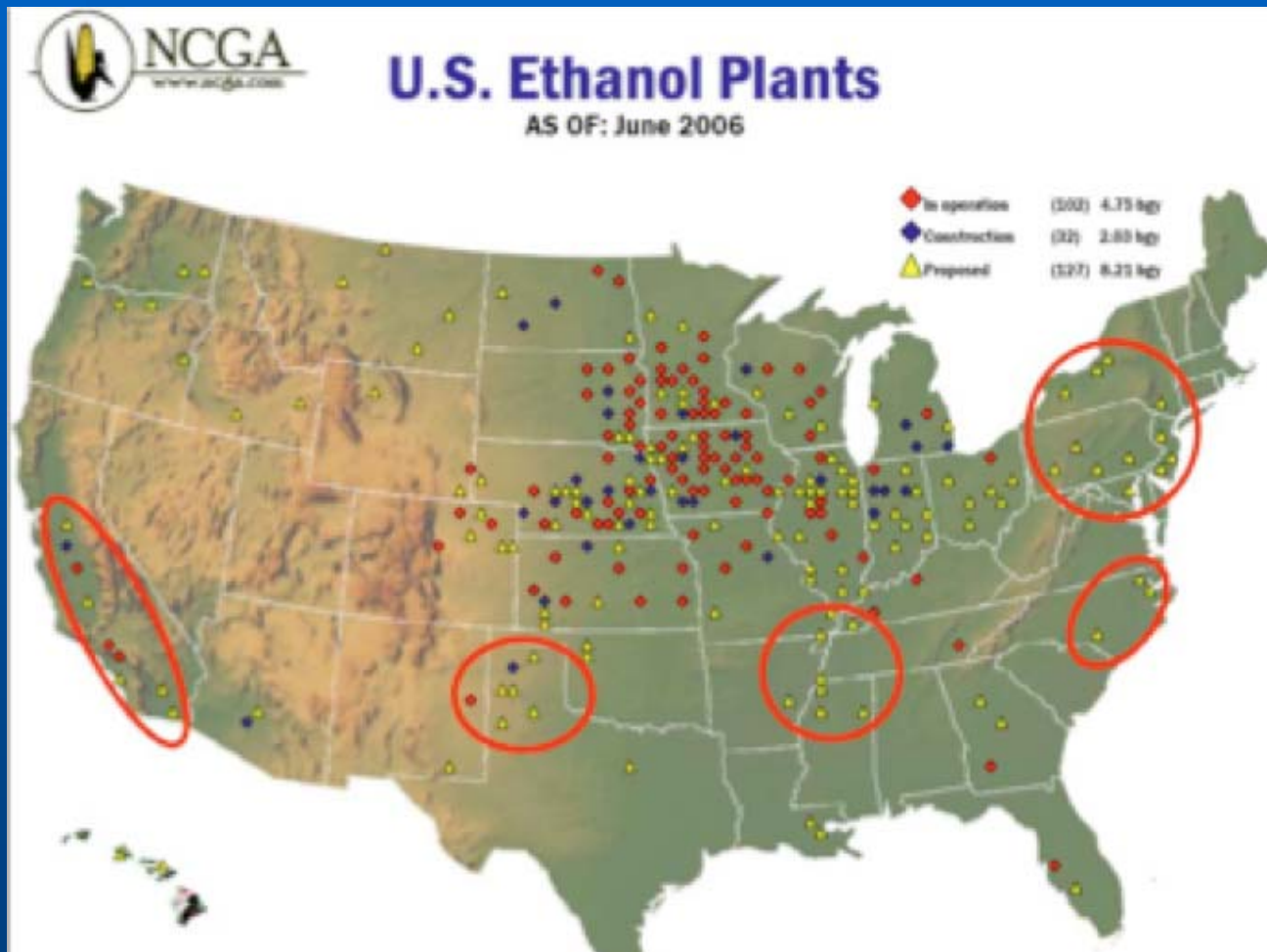
- **What country is the largest source of petroleum imports for the U.S.?**

Canada

- **What percent of our imports come from OPEC?**

40%

Where are the Ethanol Plants?



Why Has Ethanol Sprung Onto the Market?

- Oil reached \$40 a barrel
- Renewable fuel standard
 - 4 Billion in 2006 to 7.5 billion in 2012
 - Currently 6.4 billion gallon capacity
 - Currently produce about 4.8 billion gallons
 - Another 6.4 billion gallons under construction
- Blender's Credit (51¢ per gallon)
- Farm Credit aggressively financed plants

Where are the Dairy Farm Impacts?

- + Lower energy prices—maybe
- Higher corn and other feed costs
- Higher land prices
- + By-product feeds

Ethanol Production Yields...

- One bushel of corn yields
 - Ethanol 2.7 gallons
 - Distillers grain 17-18 pounds
- DGS are 1/3 the weight of the corn and all but the starch is concentrated into this volume (good and bad)

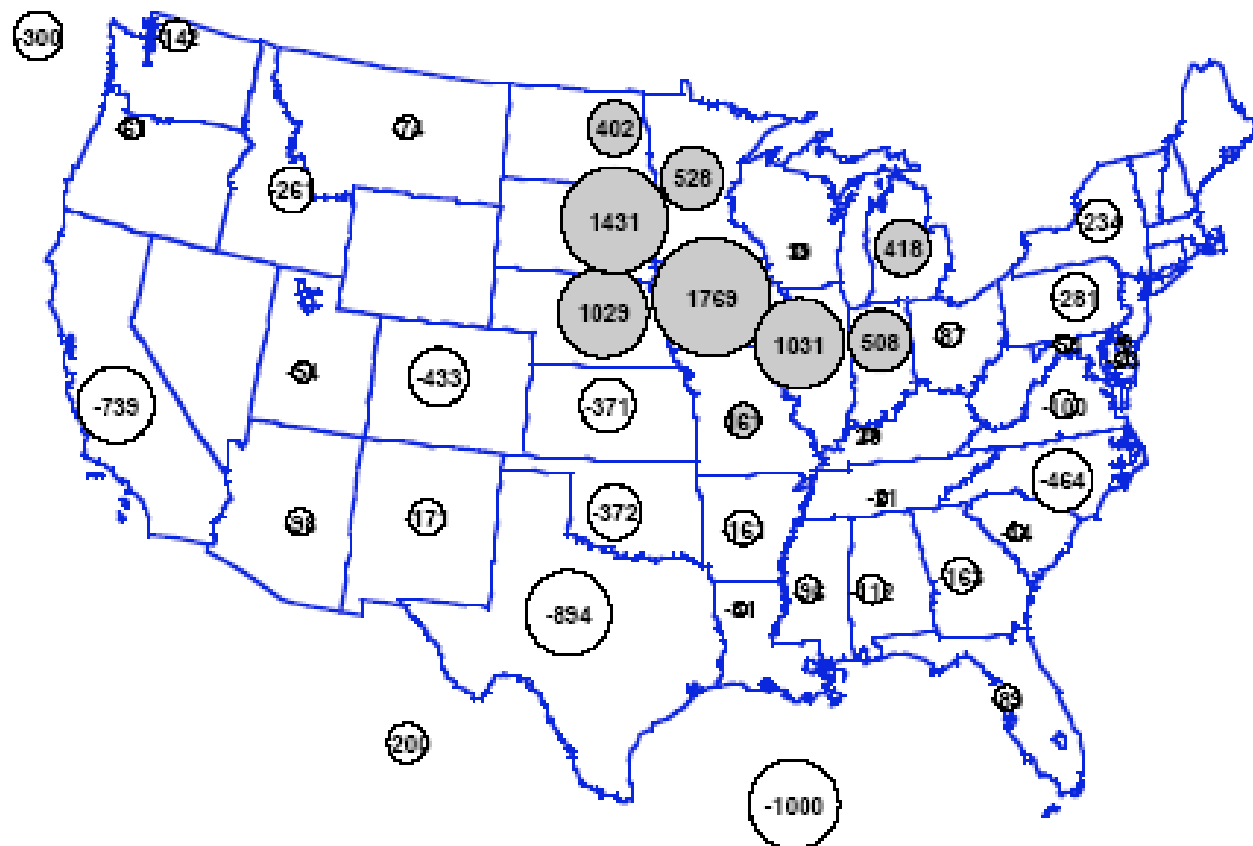
Distillers Grains

- Very palatable
- Wet about 65% dry matter
- Crude protein = 30%
- High fat = 11%
- Low fiber
- Variable quality

How much can be fed?

- **Max of 20% of ration Dry Matter**
 - 10 to 13 lbs dried
 - 30 to 40 lbs wet
 - At greater than 30% of DM will negatively impact butterfat and protein
- **Calves up to 20% of ration Dry Matter**
- **Replacement Heifers up to 25%**

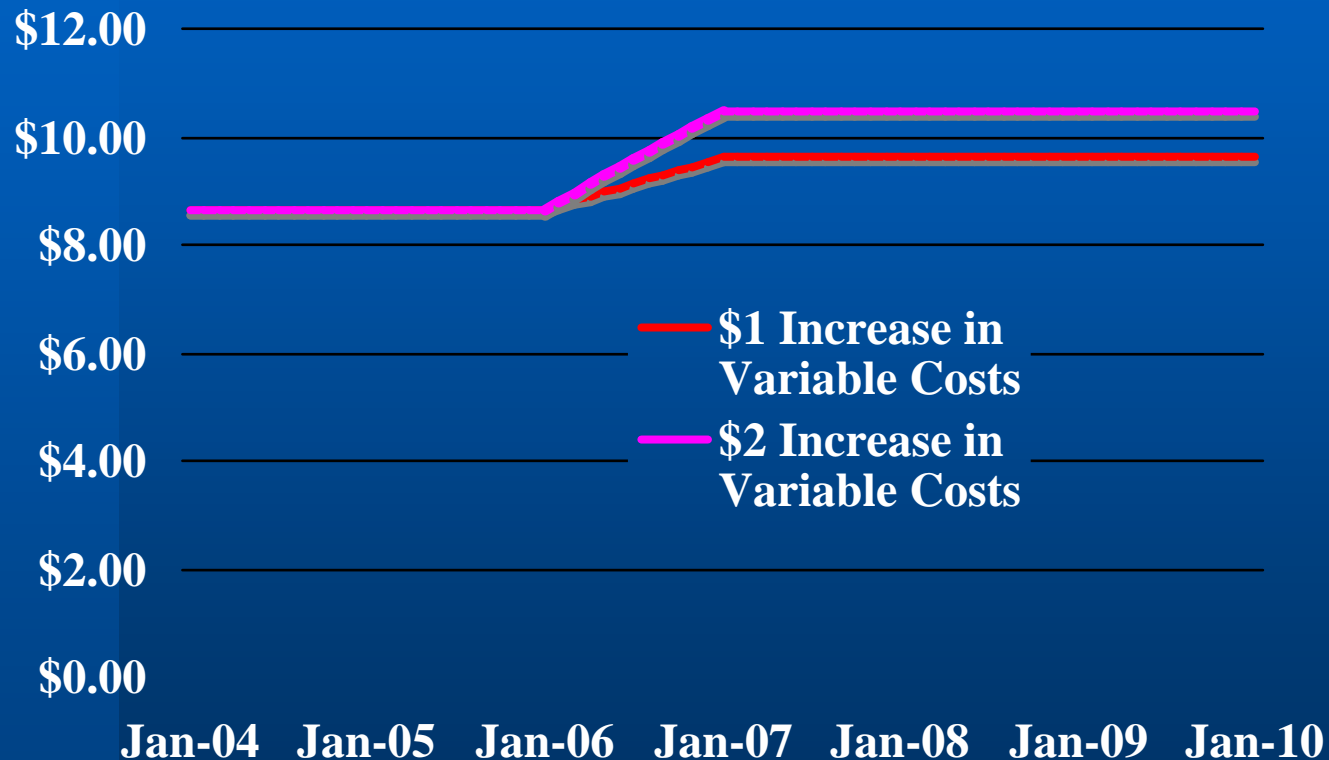
Net Exports of Distillers Grain



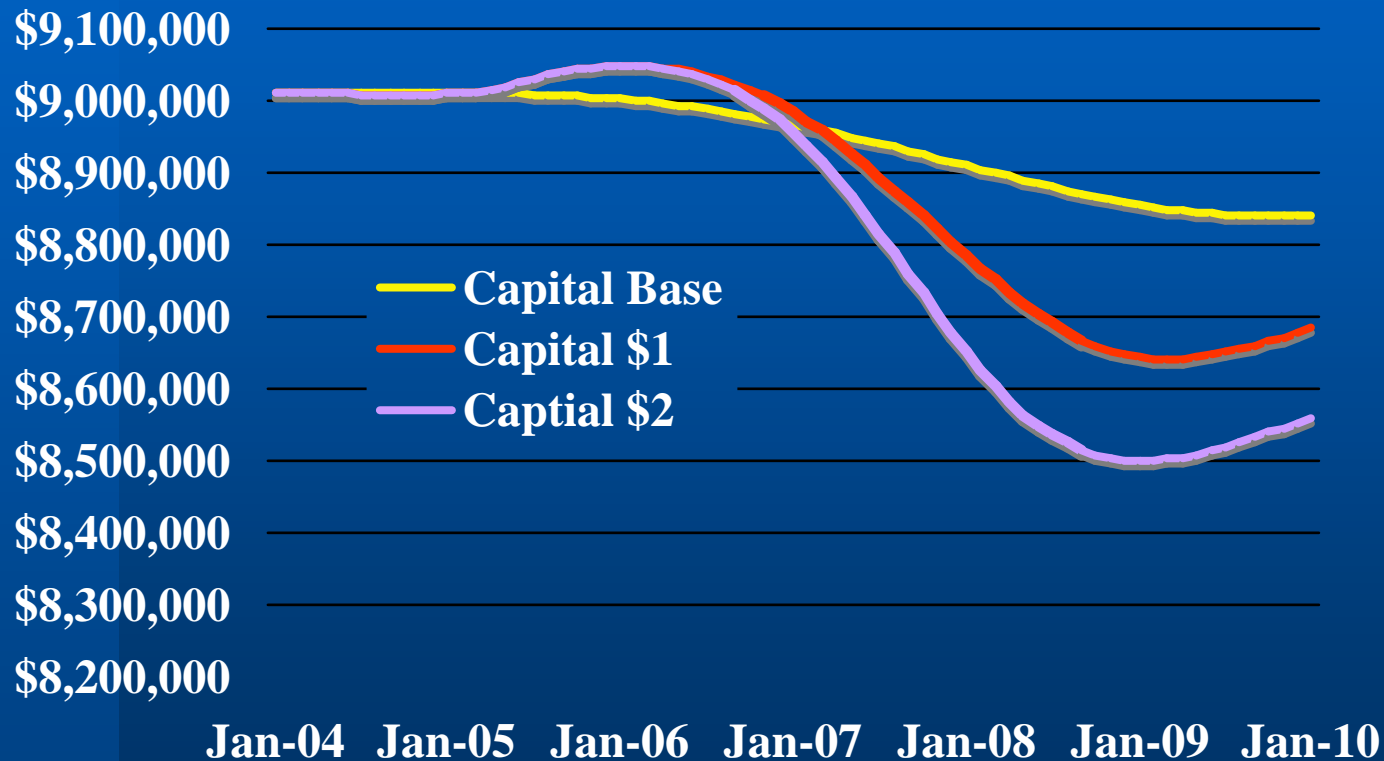
Dairy Farm Impact on Feed Costs

- About \$1 per cwt for well-managed traditional farms
- About \$1.50 for well-managed farms purchasing most of their feeds
- About \$2 per cwt for other farms

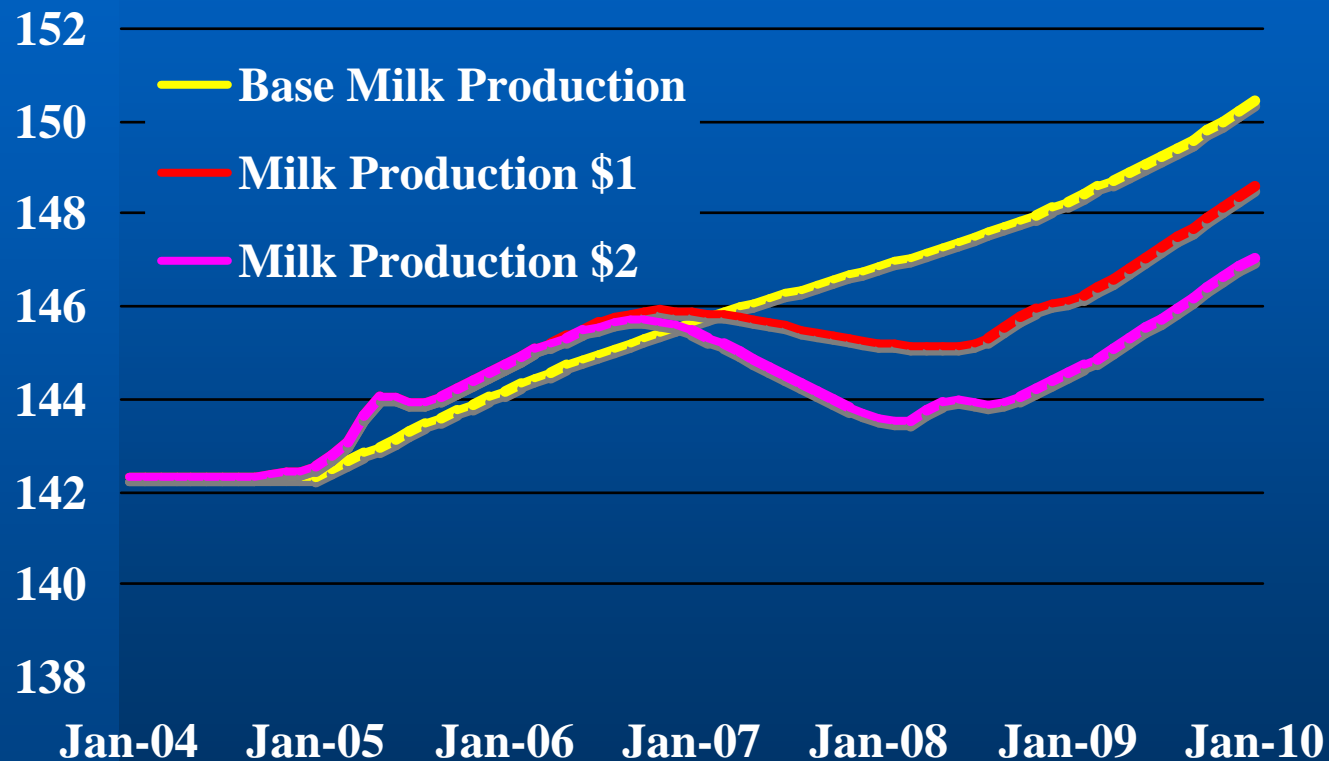
Modeling Change in Variable Costs



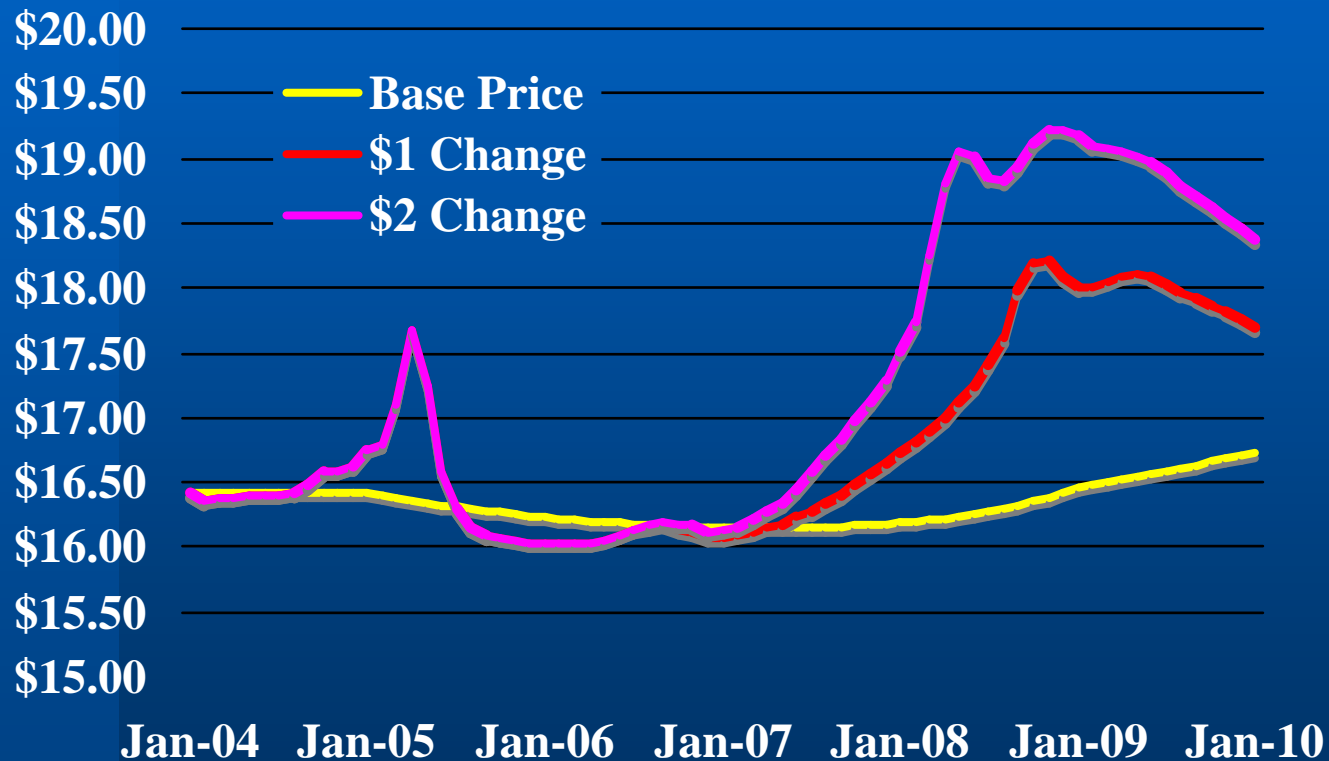
Modeling Change in Farm Capital



Modeling Change in Milk Production



Modeling Change in Milk Price



The Holy Grail

Local Farms



Corn

Ethanol Production



Fertilizer

Bio-Gas

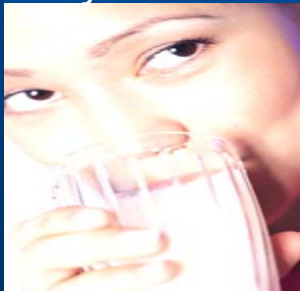
Anaerobic Digestion



Wet Distillers Grains

Thin Stillage

Dairy Products



Food Waste

Manure

Milk Production



Milk

In Summary...

- Ethanol is here for at least 10 years
- We are still learning how to feed distillers grains
- Ethanol has impacted milk prices by \$1.50 to \$2.50 dollars per cwt
- Cows and energy will be partners going forward